Individualized Format Readability:
The Messy Research Processes of Educational Technologies
Inside UAZ-Funded Scholarship

March 31, 2023
10:00am – 11:00am
Event Introduction

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Director, Center for University Education Scholarship (CUES)
Director, External Relations & Evaluation School of Mathematical Sciences
Associate Research Professor of Mathematics

Individualized Format Readability: The Messy Research Processes of Educational Technologies
Individualized Format Readability: The Messy Research Processes of Educational Technologies
I did say “Messy”

- We’re in the Middle!
- Messy Topic
- Messy Angle
- Pandemic & Methods
- Data & Analysis
Reading can be very hard if the text is small. Small text is often used to test your near vision acuity. But it turns that it also effects reading speed and comprehension. Adjusting the text size, character spacing, and line spacing can have a dramatic effect on your reading ability.
Reading can be very hard if the text is small. Small text is often used to test your near vision acuity. Adjusting the text size, character spacing, and line spacing can have a dramatic effect on your reading ability. But it turns that it also effects reading speed and comprehension.
Reading can be very hard if the text is small. Small text is often used to test your near vision acuity. But it turns that it also affects reading speed and comprehension. Adjusting the text size, character spacing, and line spacing can have a dramatic effect on your reading ability.
Line Height

Reading can be very hard if the text is small.

Small text is often used to test your near vision acuity.

But it turns that it also effects reading speed and comprehension. Adjusting the text size, character spacing, and line spacing can have a dramatic effect on your reading ability.
Character Spacing

Reading can be very hard if the text is small.
Small text is often used to test your near vision acuity.
But it turns that it also effects reading speed and comprehension.
Adjusting the text size, character spacing, and line spacing
  can have a dramatic effect on your reading ability.
“I think the factor that surprised me the most was how much of a difference **spacing** made on improving my experience, while reading digitally.”
Messy Topic: Digital Readability Research

Personalized Reading Formats are Individualized
Accelerating Adult Readers with Typeface: A Study of Individual Preferences and Effectiveness

Shaun Wallace
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Rick Treitman
Adobe Inc.

Abstract
Information overload is the challenge of the modern era and the medium. Every adult reader would benefit from faster reading, provided they could retain comprehension. The present work explores the reading speed gains possible solely by manipulating typeface. We consider that optimal typeface might be a matter of an individual’s preferred font, or that some fonts might be best for all users. Indeed, eight in ten participants believed their favorite font would be their best. Instead, we showed that the preferred rarely, seldom, best, and one font did. Adult readers in our study read with varying fonts. An average per minute difference between best typeface, or around 10 pages an hour, means fonts’ real-world significance. Our focuses on the challenges of identifying an individual’s on
Messy Angle

CUES Research Questions

1) How do faculty experience prompting students to learn about and use their personalized reading preferences?

2) How do students experience choice-making tools available through digital textbook environments?

3) How do decisions around those tools impact their reading practices, adaptation of technologies, and sense of efficacy?

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Messy Methods

- Bookstore
- Faculty
- Students
- Pandemic

- Intervention Technology
- Research Instruments
- Quantitative Analysis

The Poor Poet, painted by Carl Spitzweg in 1839. Photograph: Leemage/Corbis; grabbed from The Guardian

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Cleaning is Better with Others

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Anuj’s Reflections
Lessons from Pilot Implementation

1) Ecological, multidimensional frameworks necessary to understand impact of AI educational technologies:

- cognition
- affective
- behavioral
- social
- environmental
Anuj’s Reflections
Lessons from Pilot Implementation

2) Mixed methods, multi-phase approaches ideal for this:

• **Data Collection**
  - field intervention, not lab (activity packet)
  - survey
    - quant - VRL results, NASA task load
    - qual - UX + Rhet-Comp constructs
  - diary study (detailed student experiences of implementation)
  - focus groups (faculty experiences of implementation)

• **Data Analysis**
  - Qualitative: multi-rater coding,
  - Quantitative: descriptive, correlations, regressions
Anuj’s Reflections
Lessons from Pilot Implementation

3) Multidisciplinary teams enable this work and lead to interesting tangential research:

- Research design constructs:
  - Information Science
  - Education
  - Writing Studies
  - Applied Linguistics

- Tangential projects
  - annotated bib for WPAs,
  - research on “reading anxiety”,
  - team collaboration etc.
Bethany’s Reflections
Lessons preparing for CUES

- Multidisciplinary teams enhance research in the digital humanities: equitability, accessibility, interdisciplinary thinking

- Review of literature and secondary research require flexibility: 30+ articles regarding emotions and embodiment in reading, humanities impact, the “idea gradient”

- Revising survey instruments: reading is personal, experience vs. confidence vs. comfortability, distinguishing between leisure, work, and school
### Fresh Data...remember, it’s Messy
Ease/Difficulty of Set Up & Reading

<table>
<thead>
<tr>
<th></th>
<th>Mean (average)</th>
<th>Median (middle #)</th>
<th>Mode (most common #)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How successful setting up</td>
<td>16.38</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>(successful = high score)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How hard setting up</td>
<td>4.83</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>(easy = low score)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How successful reading</td>
<td>16.65</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>How hard reading</td>
<td>7.13</td>
<td>7</td>
<td>11</td>
</tr>
</tbody>
</table>

Nasa Task Load Index: answers on a scale of 1 (very low) to 21 (very high)

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When reflecting on their reading experiences using their Personalized Reading Format...

- surprised at positive impact
- distinguished between impact of format vs content
- eye strain
- speed/efficiency
- emotion (e.g., calm, less boring, enjoyed)
- didn’t notice difference
Making an Impact with Messy Realities

Supporting People
- Online Usability
- Multimedia Assignments

Influence Technologies
- Eli Review
- PowerNotes
- Adobe Acrobat

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Rick’s Reflection
Perspectives on Working with Academics

Virtual Readability Lab
We study how personalization can make your reading faster and more efficient

University of Central Florida
Adobe
readability matters

Individualized Format Readability: The Messy Research Processes of Educational Technologies
Accelerating Adult Readers with Typeface: A Study of Individual Preferences and Effectiveness

**Authors**
- Susan Walker, Kirk Tresman, Hong Haang, Ben D. Sawyer, Zoya Byzovski

**Published**
25 April 2020

**Abstract**
Information overload is the challenge of the modern era and the modern medium. Every adult reader would benefit from faster reading, provided they could retain comprehension. The present work explores the reading speed gains possible solely by manipulating typeface. We consider that optimal typeface might be a matter of an individual's preferred font, or that some fonts might be better for all users. Indeed, eight of ten of our participants believed their favorite font would be their best. Instead, our findings showed that the preferred font was seldom best, and one font did not fit all. Adult readers in our study read better with varying fonts. An average 117 word per minute difference between worst and best typeface, or around 10 additional pages in an hour, means font choice is of real-world significance. Our discussion focuses on the challenges of rapidly identifying an individual's optimal font, and the exciting individualization technologies such an advance allows.

**CHI EA’20**

**Individual Differences in Font Preference & Effectiveness as Applied to Interlude Reading in the Digital Age**

**Authors**
- Shawn Walker, Kirk Tresman, Nirmal Kumar, Kathleen Arpin, Jeff Haang, Ben Sawyer, Zoya Byzovski

**Published**

**Abstract**
In the age of pervasive reading on digital devices, incredible opportunities for customized interfaces abound. We consider how personalizing body text font can improve reading outcomes for adult readers. We present results of large-scale Interlude Reading experiments run on 386 crowdsourced participants, whereby we tested 16 body text fonts and measured impacts on font preference and reading speed. We define “Interlude Reading” as the form of reading that occurs in short interludes and is common in the mobile context. Our studies controlled for participants' interest and familiarity with reading passages, familiarity with font families, and font size - via a perceptually-based font size normalization technique. While past work has considered how these factors affect reading in isolation, we present the first study that combines these factors under a single experimental methodology. First, our results show that...
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Section 1
INTRODUCTION

1. Introduction
2. Related Work
3. Methodology
FOREWORD

In 1986, the Congress of the United States passed the Commercial Motor Vehicle Safety Act. This Act requires the states to adopt uniform minimum licensing and testing standards for drivers of commercial motor vehicles. By April 1, 1992, all drivers of commercial vehicles needed a Commercial Driver’s License. Maryland’s Commercial Driver’s License Program became effective January 1, 1990. This was the beginning of a new era that resulted in each commercial driver to be looked upon as a professional.
2.10.3 – What You Should Do …

- driving and road rage?

5. What should you do when confronted with an aggressive driver?

6. What are some things you can do to reduce your stress before and while you drive?

These questions may be on the test. If you can’t answer them all, re-read subsections and 2.10.
Placeholder for New York Times image connected to the Malawi HIV+ Project.

Image may be referenced at:
Malawi HIV+ Project

- 1200 Case Workers
- Deploy to remote villages with information packs
- Needs assessment
- Focus Groups before and after pilot
- Measured results
A1. PROMOTING HIV TESTING FOR CHILDREN AND CAREGIVERS

- Testing infants and children while they are very young is lifesaving. Without treatment, more than half of infants and young children with HIV will die before reaching their second birthday. However, starting treatment early is very effective and is the best way to keep children healthy.

- Testing positive for HIV is not a death sentence. In fact, it is the opposite. Testing is what will allow babies and children to get lifesaving treatment if they need it. With treatment, infants and children can grow up to live healthy and normal lives. Testing is the first step. If your child tests positive, he/she will be put on

A2. KUFUNIKA KWA KUMKHWALA MOYENERA KOMANSO MWANDONOMEKO

- Nkutheka mumadzifusa kuti ma ARV amagwira ntchito bwanji komanso ndi chifukwa chani munthu amene akumwa mankhwalawa ayenera kumwa tsiku irilongwe, mulingo woyenera, pantawi yake ngakhale munthu akupeza bwino.

- Cholinga cha kumwa mankhwalwa ama ARV moyenera ndi kuchepetsa kuchuluka kwa tizilombo ta HIV komanso kuondezeza chithelezo cha mthupi. Ubwino womwa mankhwalwa mwandondomeko naku:
  - Munthu amakhala
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The Readability Consortium

- Research
- Tools
- Data sets
- Community
A personalized reading format across all reading surfaces enabling everyone to read their best.
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Shelley’s Reflection
Messy Works!

2. Undergraduate Research Partnership Faculty Challenge Grants
3. CUES Fellows Learning Community (FeLC)

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2023 CUES Distinguished Fellowships

Nominations due April 3 | Read more >>>

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2023 MECha Workshop: Teaching & Learning Assistants in the Classroom, Across Disciplines

APR 21 & APR 22 | Pre-Register >>>

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